

CODING FORM FOR SRC INDEXING

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Submitting Organization		
INTL ISOCYANATE INST		
Contractor		
Document Title		
ISOCYANATE MONOMERS IN FOAM AND POLYURETHANE PRODUCTS		
Chemical Category		
TOLUENE DIISOCYANATE (1321-38-6)		

CONTAINS NO CBI

Not L. chemical substance -

Montedison 7/9/8

EPA-OTS

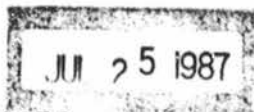


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PROJECT EH-29

ISOCYANATE MONOMER IN PU FOAM

10237



86-870000645

1. Scope

Regulatory bodies in Europe, particularly the Swedish government have become increasingly concerned with the possibility of isocyanate monomers in foam and polyurethane products.

A preliminary research has been carried out at Montedison.

2. Principle

The TDI content in foam is determined by extraction in dry o-dichlorobenzene (DCB) (not containing any impurity with the same chromatographic retention time as TDI) and gas-chromatographic determination using a flame ionization detector.

Note: increase in sensitivity can be obtained using a specific nitrogen detector.

3. Procedure

About 2g of foam is weighted to an accuracy of 0,1mg and placed in A (see figure).

10 ml of dry DCB (under molecular sieves) are added and the sample is alternately compressed by plug B (syringe C) for about 10 min.

With a microsyringe, through the septum D, a quantity of solvent is taken and immediately analysed at following conditions:

chromatograph	: C. Erba Fractovap mod. 2300 or equivalent
column	: 2,8 m x 3 mm ID glass, packed with 10% OV 101 on 80 + 100 mesh chromosorb WAW DMCS
carrier gas	: nitrogen; inlet pressure 1,7 Kg/cm ² , rate 95 ml/min.
detector	: FID; hydrogen 65 ml/min; air 320 ml/min

CONTAINING NO CBI

temperature, °C : detector 200, inj. 200, column 170
sample size : 3 µl
recorder : Leeds & Northrup Speedomax mod. W or
equivalent, 1 mV f.s., 1 sec f.s.,
chart speed 30"/hr

Note: the extracted solution must be immediately analysed
because TDI content is not constant probably by
reaction of TDI with other extracted reactive compounds.

Expression of results

Calculation is made by external standard method, using
calibration solutions of TDI in dry DCB and multiplying by
dilution factor (amount DCB/amount sample).

4. Results

The foam examined was prepared according the following
formulation:

polyol Glendion FG 3501 (MW 3500)	100	p/w
water	4,8	"
Niavax A1	0,3	"
Sn octoate	0,15	"
silicon B 2370 (Goldschmidt)	1,5	"
TDI index 1,05	56,44	"

The sample was analysed 1 hr and 24 hrs after the
production and it was kept in ambient air (RH 70%) and in
dry atmosphere (under P_2O_5).

Analyses showed that the fresh foam contained about
300 ppm of TDI and the same sample, after 24 hrs, was TDI
free (<5 ppm).

The same result was obtained for both samples: dry
or ambient atmosphere. No presence of TDA was observed in
the cromatograms.

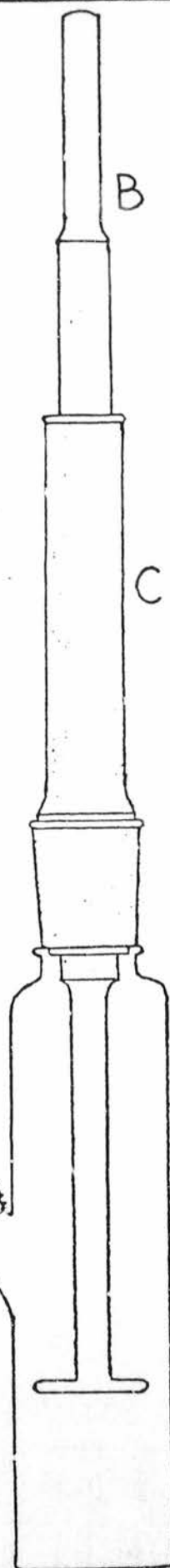
5. Conclusions

TDI monomer, wich is present at levels of about 300 ppm
in fresh foam (1 hr after production), desappears after 24
hrs under all storage conditions (ambient and dry air).

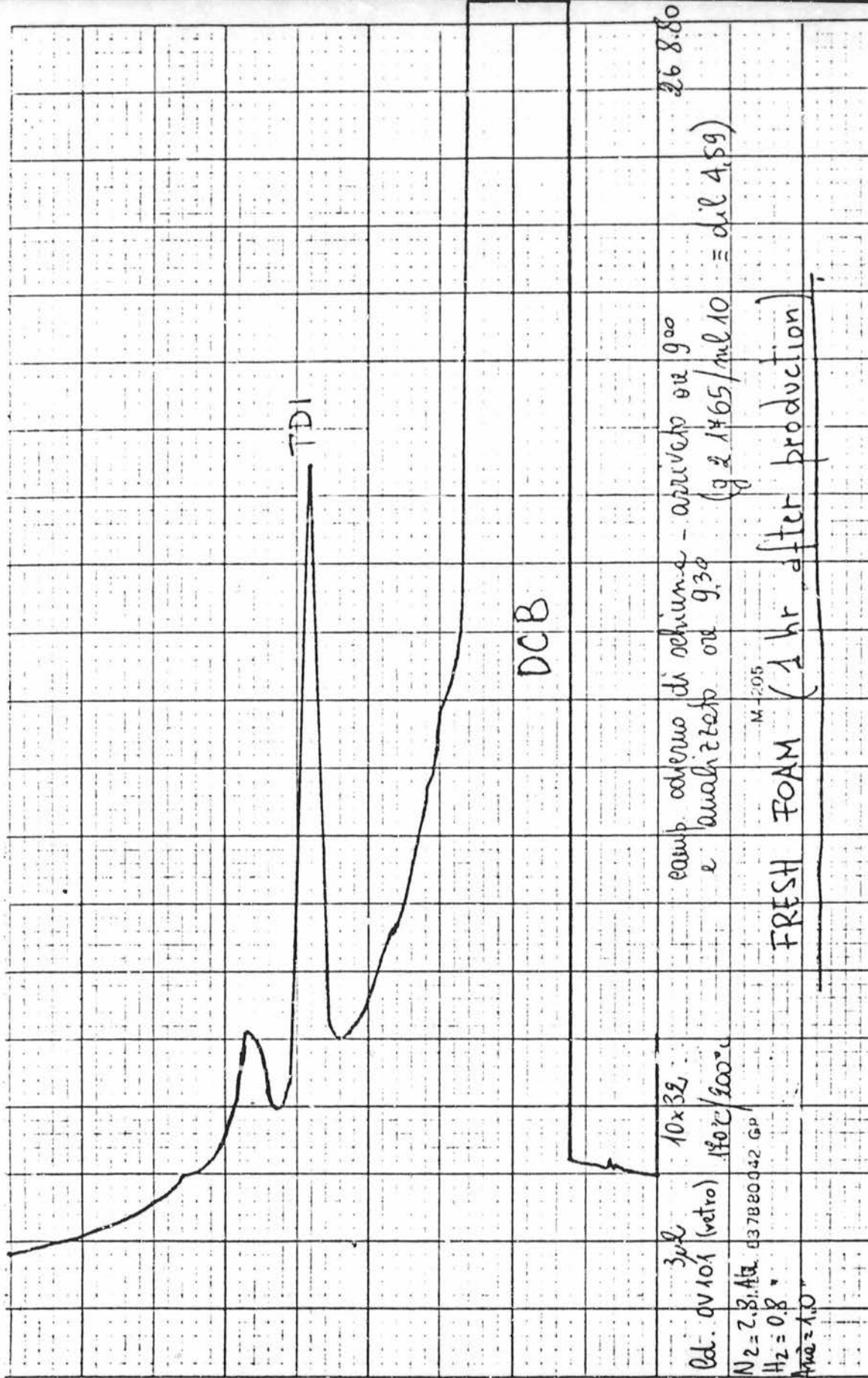
TDI possibly reacts not with moisture but with low
molecular reactive compounds present in the foam giving non
volatile products.

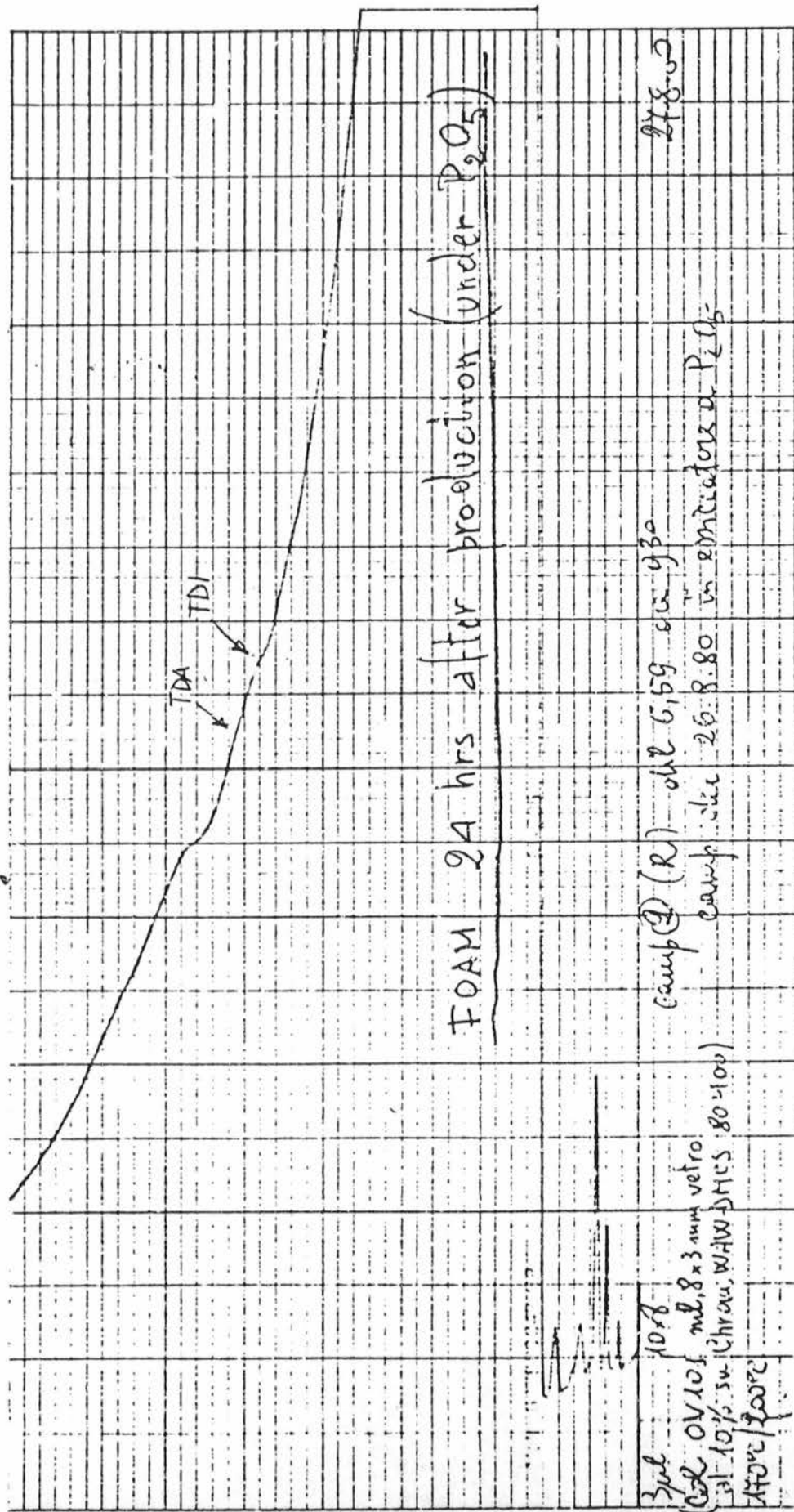
These results show that use of PU foam is safe respect
to presence of TDI residue.

rubber
septum



scale 1:1





TDI →

27.8.80

Mix 1,2 ppm/u TDI in 0-DEB

27.8.80

0-DEB x p.b.



10x8 3000 C.D. 51 (0.101)

N₂ = 2.8 A_{me} = 1.0
H₂ = 0.8

CERTIFICATE OF AUTHENTICITY

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